DOCUMENT RESUME

ED 402 119 RC 020 779

AUTHOR Pittman, Robert B.
TITLE Economic Development: A Major Goal for Rural Education?
PUB DATE Oct 96
NOTE 14p.; Presented at the Annual Meeting of the National Rural Education Association Research Forum (San Antonio, TX, October 1996).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Graduates; *Economic Development; *Educational Attainment; *Educational Status Comparison; Higher Education; High School Graduates; High Schools; Human Capital; Income; *Role of Education; *Rural Education; *Rural Urban Differences

ABSTRACT

Several studies raise serious doubts about whether economic development should be a goal for rural education and whether a causal relationship exists between education level and income. This study sought to determine the nature of the relationship between level of schooling and income level. Census data from 1940 to the present for 13 rural states and 13 nonrural states were used to compare percentage of high school graduates in each state with per capita income and percentage of college graduates with per capita income. Results reveal a very strong association between a state's per capita income and the percentage of that state's population graduating from high school 10 years later. This association is not as strong for college graduates, but advances in the relative amount of education seem to follow relative advances in income. This suggests that the economic development of rural areas is more a result of existing economic advantages than of the educational level of the available work force. Thus the human capital argument does not adequately explain the economic development of an entire rural region or state. Taken to the extreme, the results suggest that education can produce the greatest impact on economic development by having students who will develop industry, as opposed to staffing industry. Contains 8 graphs and 10 references. (TD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 402 119

Economic Development:

A Major Goal for Rural Education?

Robert B. Pittman

Western Carolina University

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Robert B. Pittman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC).

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Paper presented at the annual meeting of the
National Rural Education Association Research Forum
San Antonio, Texas
October, 1996

RC 020779

BEST COPY AVAILABLE

Economic Development:

A Major Goal for Rural Education?

Robert B. Pittman
Western Carolina University

INTRODUCTION

Each spring, the Corporation for Enterprise Development publishes the results of its annual ranking of the states' economic development potential. Using current economic performance (employment, earnings), business vitality, (competitiveness of existing businesses, new companies), and development capacity (high school graduation rates, college graduation rates, technology resources, financial resources); the corporation rates each state's and region's economic climate . In 1995, rural states tended to be rated in the bottom 30 - 40%, and the six states given the lowest overall rankings were all "rural" (Corporation for Enterprise Development, 1995). Their grades ranged from C to F in economic performance, B to F in business vitality, and D to F in development capacity. If this latter category, development capacity, represents the economic future or the capability to construct a better economic future, then these states seem destined to have a relatively less bright economic future. While this rating alone is not sufficient reason to declare an economic emergency for rural areas, it does reflect an economic picture noted by others. Redman and Rowley (1989) describes per capita income and earning differentials favoring metropolitan states/counties in comparison with nonmetropolitan (rural) ones. In like manner a publication from one state's rural development office pointed out that per capita income was less in rural areas of the state than in the more urban regions and that this income discrepancy had increased in recent years. Also noted was the fact that the educational attainment of the rural population was less than that of their urban counterparts (The Rural Economic Development Center, 1992). Given the importance which educational level is assumed to have in the economic development of a nation, state, or region (Reich, 1991), it seems as if the lack of economic vibrancy in rural states and rural areas may be, at least in part, due to lower levels of education. This suggests that elevating the educational level of a rural state's population could improve its economic development. The extension of this line of reasoning culminates in the position that economic development should be one of the major goals for rural education.

Using economic development as a major goal for rural education rests upon an assumed causal relationship between education level and income, as well as a theoretical base. Human capital theory, as reviewed in DeYoung (1989), posits that economic development is largely dependent upon the human skills resource pool available. At the individual level this means that more education results in the person being in more demand for jobs due to the improved skill base. From this, one could deduce that if the educational level of an area's population were increased, job related skills would be increased, and one would anticipate a resulting improvement in the general economic development due to the availability of a more skilled work force. Such a view is an assumption of the Corporation for Enterprise Development. However, not all research evidence suggests that this theory accurately describes the relationship between educational level and economic attainment. Wanner and Lewis (1982) found no consistent pattern in the relationship between educational attainment and the relative level of earnings, but educational level was found to be linked to the absolute level of income and inequalities in income across occupations. While these latter results do support human capital

thecry, the fact that there was no consistent pattern in the other elements of the relationship suggests the theory is not completely accurate in describing the role of educational attainment in economic development. An alternative explanation, job competition theory, is supported by this lack of a well defined relationship across occupations. This theory proposes that earnings within a job market are more a function of job experience and factors unique to that labor market, as opposed to a more global variable, such as educational attainment. Therefore, economic development is more a function of market factors rather than the educational level of the available work force.

Further doubt regarding the validity of the human capital theory, as it relates to rural economic development, is raised by Killian and Parker (1991). In this publication it was reported that the value of education in the economic growth of an area was overstated and that the real driving force in economic development appeared to be the "mix of local industries and how well these were performing at the national level" (p. 7). This conclusion supports the individual labor market emphasis of job competition theory in developing an understanding of why educational level would not be the most significant factor in rural economic growth. DeYoung and McKenzie (1992) cites results from other research which suggested an inverse relationship between economic growth and educational level.

The results from these studies raise serious doubts about having some long range economic outcome as a goal for rural education and there being a causal relationship between education level and income. While the existence of a relationship between income and education level is well known, the nature of this relationship needs to be clarified. The present investigation sought to accomplish this by looking at the relationship over time and in so doing, determining whether a causal link might exist. If one does exist, then an economic goal for rural education may be warranted; if not, then the cautions raised in Hobbes (1995) concerning the focus of educational efforts on rural economic growth rather than rural development are supported. The specific research question which guided the study was 'what is the nature of the relationship between level of schooling and income level'.

METHOD

This question was investigated employing aggregate data for the states drawn from the U.S. Census for the decades beginning in 1940 to the present. State level data were used because economic/educational policies are more likely to be formulated and implemented at the state level. Thus a more global view of the impact of these policies and trends over time could be observed while reducing the influence of more localized vagaries on the relationship. The year 1940 was selected as the point of initiation because one of the variables pertinent to the study, educational level, was reported in a retrievable form initially with that census. The percentage of the adult population classified as having finished high school, the percentage of the adult population with a bachelors degree, and per capita income were used to define the major variables of the study. Two different educational variables were used as opposed to a single median years of education because Killian and Parker (1991) reported different relationships between each of these variables and income level. Per capita income was used to operationally define economic attainment and to serve as a proxy for economic development.

In developing the analysis of the data, it was assumed that if educational level contributed to economic attainment, then by looking historically at different segments of the population (states) that are known to differ in income and educational levels, one might be able to discern

how changes in income levels precede, follow, or are not linked to changes in educational level. Rural and metropolitan populations within the United States have typically differed in general educational and economic backgrounds. Using the relative degree of change over time in education and income for these two populations would clarify the relationship between educational level and income level. As such, if education level is a primary factor in economic growth, then relative changes in it for both rural and nonrural areas would result in subsequent changes in per capita income. The first step in the analysis of the data was to identify rural and nonrural states. This was achieved by determining those states classified as being among the most rural (top 30%) in 1940 and also in 1990. Likewise, the states which were the most urban for the two years mentioned above were identified. It was felt that this method would produce areas which were consistently rural and nonrural and thus would reduce the influence of some other variables. There were 13 states in each grouping. Trends in the educational variables and the economic variable for these rural and nonrural areas were explored by plotting the data for the variables across each of the six census years. The graphical approach to analyzing the trends was based upon a suggested approach for short time series offered in Cook and Campbell (1979). For several of the plots lagged variables were used based upon the assumption that changes in one variable might not be reflected in changes in the other immediately, but rather there might be a delayed effect. The lag interval used was one census period, i.e. if per capita income were lagged, then the 1940 educational variables would be plotted against the 1950 per capita income variable.

RESULTS and DISCUSSION

The purpose of the study was to determine the relationship between educational level and income, particularly as it related to rural areas (states). As a first step in developing this description, the data for the 26 rural/nonrural states described previously were used to produce correlation coefficients between a state's per capita income and the two educational variables. This was done within each census in order to gain some sense of the stability of the relationship. Table 1 contains these coefficients.

All of the computed coefficients were positive indicating that as the relative amount of education among the states increased, there was a corresponding relative increase in per capita income. The magnitude of the relationship varied from 14 to 46 percent common variance between the high school education variable and per capita income. The median for these coefficients was 36%. Between the college education variable and per capita income, the percent common variance ranged from 32 to 48 with a median of 39%. Across the span of six decades, variation in the educational level of a state's population accounted for slightly over one-third of the variation in per capita income for the states in the analysis. This suggests that if a causal link exists between the educational background of a state's population and the economic vibrancy of the state, then it is a substantial one. The relationship is slightly stronger and more consistent between the income variable and college education level than between income and high school education level. This is consistent with what one might expect, i.e. higher paying jobs and more consistent employment among the college educated.

Table 1

Correlation Coefficients Between Educational Levels
and Per Capita Income for the Census Years 1940 - 1990

		Variable	
Variable	Year	% Population High School Graduate	% Population With Bachelors Degree
	1940	.54	.67
	1950	.68	.69
	1960	.66	.63
Per Capita Income	1970	.59	.62
	1980	.60	.57
	1990	.38	.61

The picture painted by these correlations provides strong support for having economic development as a major goal for rural education. Since correlations provide evidence regarding the strength of a relationship rather than its nature, e.g. causal or not, the possibility of a causal link was explored by investigating the trends in the relative economic and educational growth for rural and nonrural states. If differences on a variable within the 60 year interval precede or follow changes on the other variable, then a causal relationship may exist. If such changes are not related to other changes, then no causal relationship exists between the variables.

Recognizing that the general level of education and income has risen for the entire population over the past 60 years necessitated looking at the income/education data in a form that would allow comparability across scales (income and education) and would indicate the relative changes in income/education between the more rural and the more metropolitan states. In order to achieve this, the raw data were converted to standard scores and these were plotted to develop a picture of the trends in relative income and education level for rural and metropolitan states.

The first trends plotted were for the education level variables and the per capita income variable for the metropolitan and the rural states. These plots are presented in Figures 1 and 2.

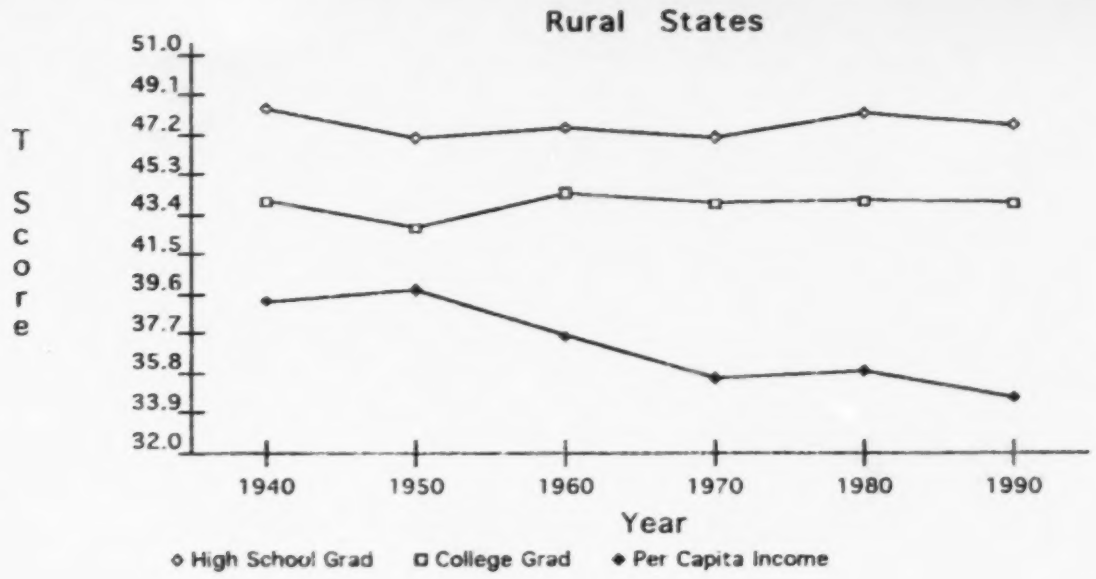

Figure 1. Education and Income Trends for Rural States

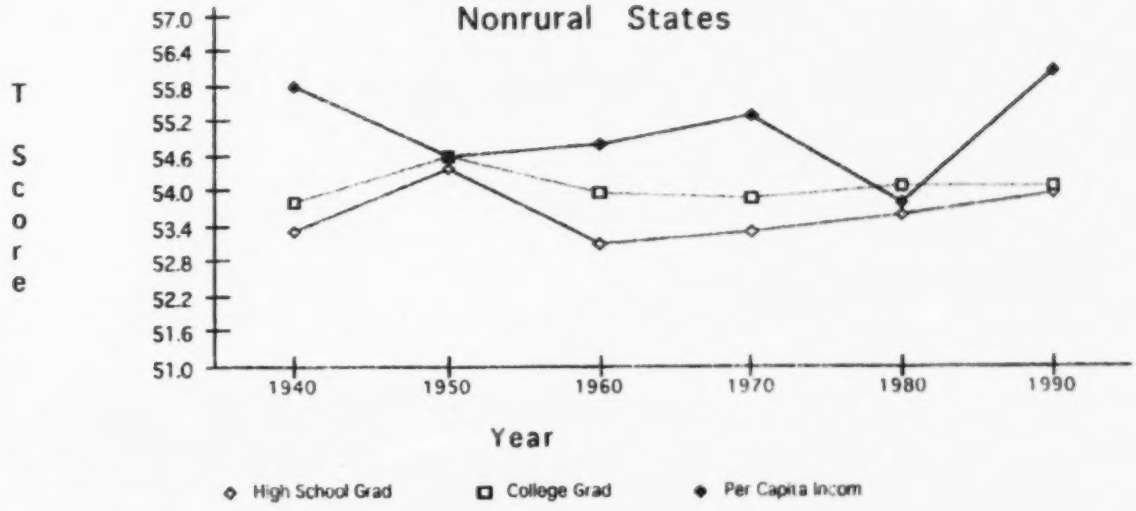

Figure 2. Education and Income Trends for Nonrural States

In looking at Figure 1, the percentage of the adult population in rural states graduating from high school remained much the same relative to the average of the entire population. There was a dramatic increase in the actual percentage, but the relative position remained fairly constant. A similar pattern was observed for the percentage of the adult population with a bachelors degree. The same was not the case for per capita income. The economic position of the citizens of rural states actually got worse relative to the entire population's average over the 50 year period. What can be discerned from these plots about the relationship between educational level and income level for rural states? It does not appear from the patterns for the two variables that there exists a well defined relationship. The fact that the relative educational levels remained fairly constant and the relative income decreased suggests there is no relationship between the variables for rural states.

The information in Figure 2, metropolitan states, is somewhat similar. The trends in the relative percentage of high school and college graduates parallel one another. When these are compared to the income plot, no definitive relationship emerges. In the two instances in which there were dramatic changes in the amount of income, the corresponding trend in the education variables was a sharp increase on one occasion and remaining relatively unchanged in the second instance. In summarizing the information from these two figures, it seems as if there is not a straightforward relationship between education level and income level, i.e. increases in education are associated with increases in income.

This lack of a well defined link between the two variables was explored further by assuming that changes in one of the variables might not be reflected in changes in the other variable until a later point in time. Following up on this, another series of plots was produced using lagged variables. The lag interval used was one census. Figures 3 and 4 have income as the lagged variable. A trend here would suggest that changes in education level are associated with subsequent changes in income. Such a trend would be suggestive of a causal link between the variables and would strongly support human capital theory. The plots in Figures 3 and 4 present much the same picture as was observed in the previous plots. This picture is that there is no well defined relationship between the relative educational level across the state and relative income level ten years later, i.e. it does not seem as if relative increases in education produce relative changes in income level.

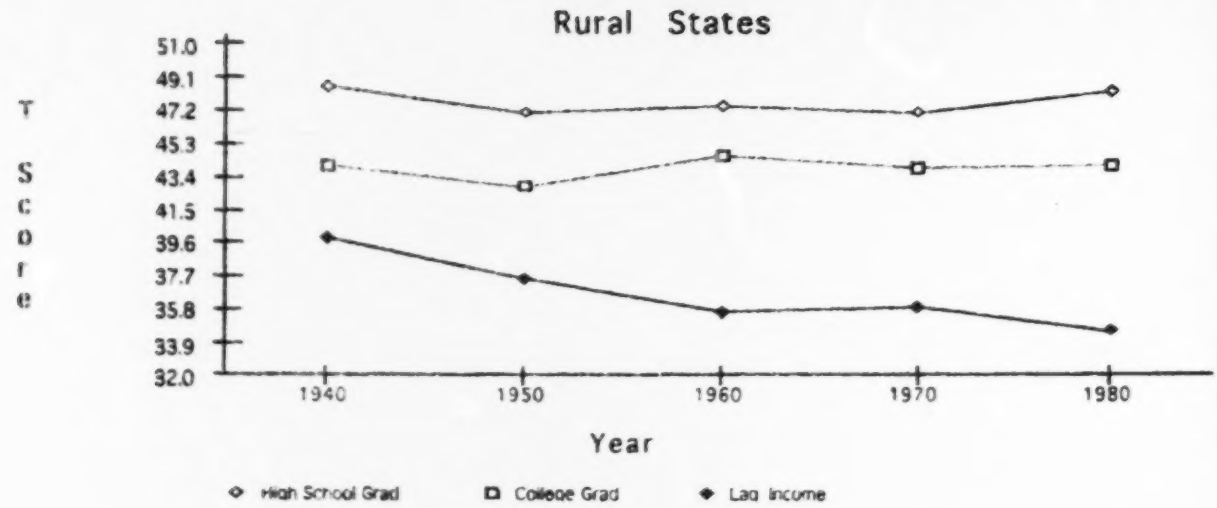

Figure 3. Education and Lagged Income Trends for Rural States

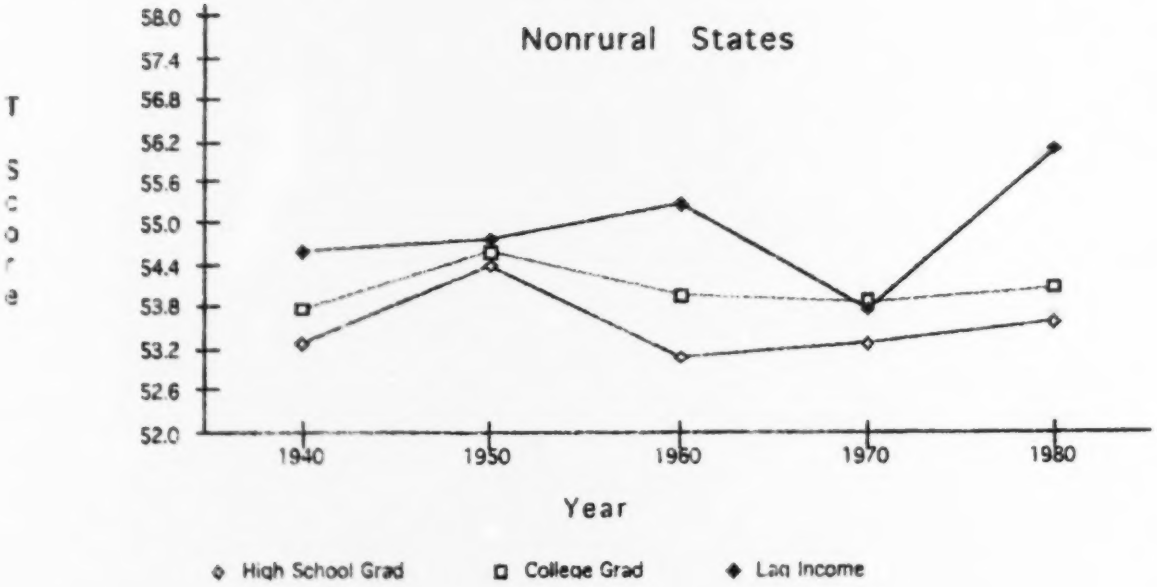

Figure 4. Education and Lagged Income trends for Nonrural States

A slightly different scenario was projected in Figures 5 and 6. For these the educational variables were lagged and plotted against income. The assumption underlying these plots was that economic development is the first cause. Economic development produces higher income. The increased wealth expands education. The developed industry uses education as a screening device for employees, so education level in the area increases. If the development of industry in the area necessitates a more highly educated work force, then individuals migrate to it from other areas of less economic development.

Figure 5 presents the information for the rural states. The first three sets of data points are somewhat supportive in that all three increase and then decrease. Beyond this point, however, the pattern becomes completely unraveled. The trends in Figure 6 are supportive of this interpretation up to the last set of data points. The information in the two figures hint that there is a greater probability that economic development, as reflected in per capita income, spurs educational development as opposed to vice versa.

This notion was pursued further by developing a different set of comparisons. As in the other analyses, the first of these used the data from the rural/nonrural states . In this analysis percentages were computed. For example, the per capita income for the rural states in 1940 was approximately $400. For the nonrural states the figure was $726. The $400 figure represents 55% of the $726 per capita income for the nonrural states. Similar percentages were computed for each variable for each census year. These reflected the position of the rural states relative to that of the nonrural states, rather than in relation to the total population of states as was the case with the standard scores. It was assumed that by removing the states in the "middle" from the analysis, the link between the education level of a state and potential economic development would be clarified. Since in the previous analyses, the only trends which showed any potential involved income and the lagged education variables, only trends involving the ratio of those variables was investigated. The plot of these trend lines is shown in Figure 7. The trend lines for the lagged high school graduation rate and per capita income are somewhat similar. While not perfectly parallel, the slopes for the different segments of the two trend lines are all positive, whereas this is not the case for the college rate variable. This suggests that income or economic development in rural areas may produce educational advancement.

The last analysis did not use the rural/metropolitan groupings because there may have been high levels of economic development within the economies of some of the represented rural states. Therefore, if the dynamics outlined above were operational, then the rural states with highly developed economies would have had increases in relative education level, while those rural states with less developed economies would not have observed similar relative gains. The suggested comparison was made by identifying those states that were in the lower 30% on per capita income in 1940 and those in the top 30%. These were classified as the low income and high income states. The mean score on each of the three variables was computed for each census year for these two groups of states. A ratio was created for each census year by dividing the average obtained for the low income states by the average for the high income states. These ratios reflected the relative distance between the low and high income states on the three variables. Therefore, changes in the actual magnitude of one variable for the low income states would be reflected in the ratio as a function of whether it (the change in the variable) closed the gap with the high income states or not.

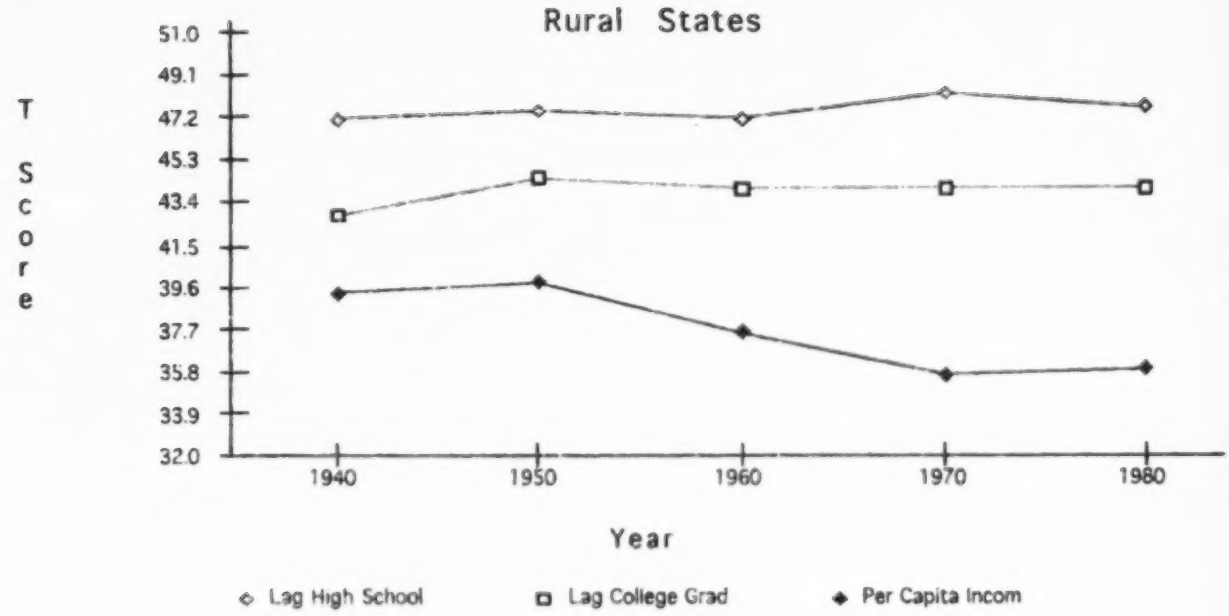

Figure 5. Income and Lagged Education Trends for Rural States

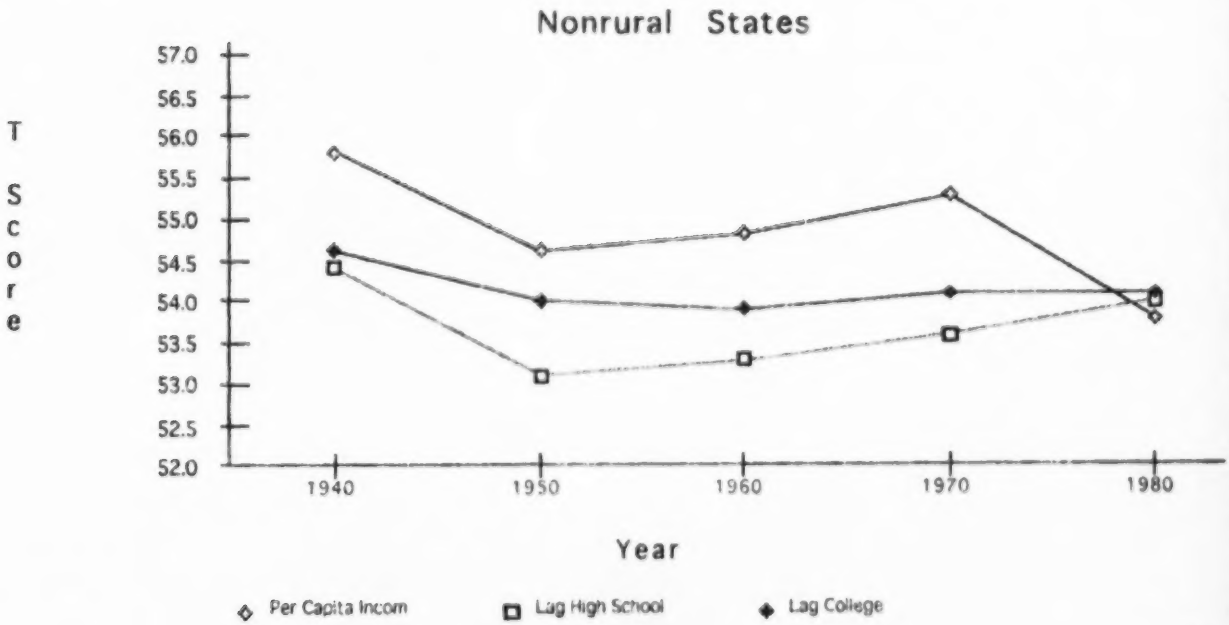

Figure 6. Income and Lagged Education for Nonrural States

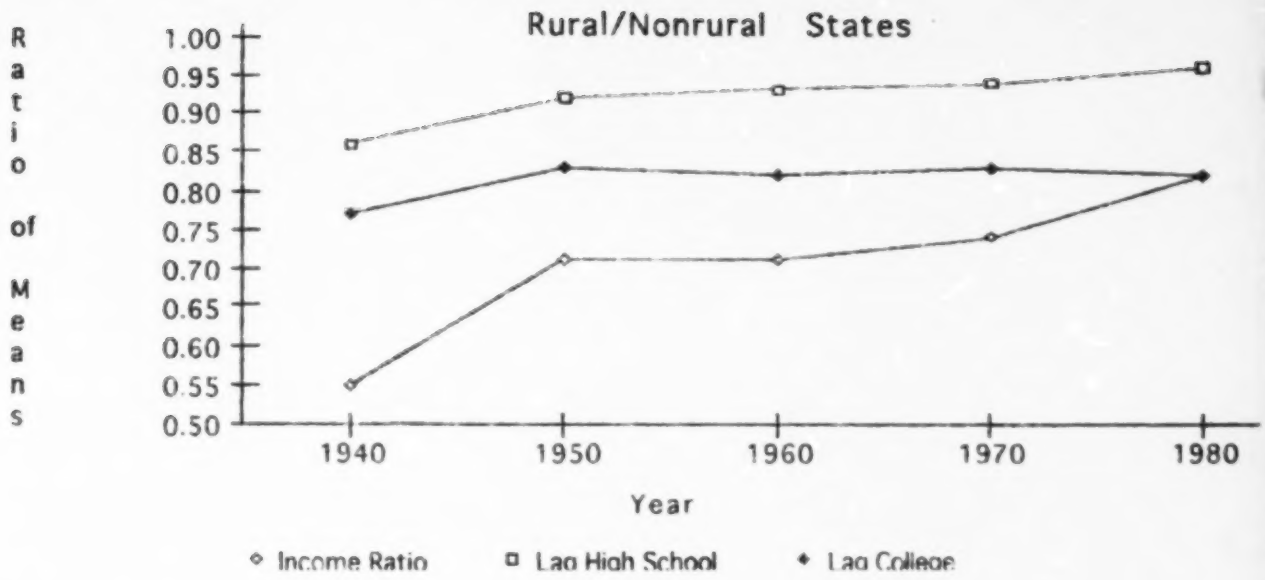

Figure 7. Trends in the Ratio of Mean Income and Lagged Education for Rural/Nonrual States

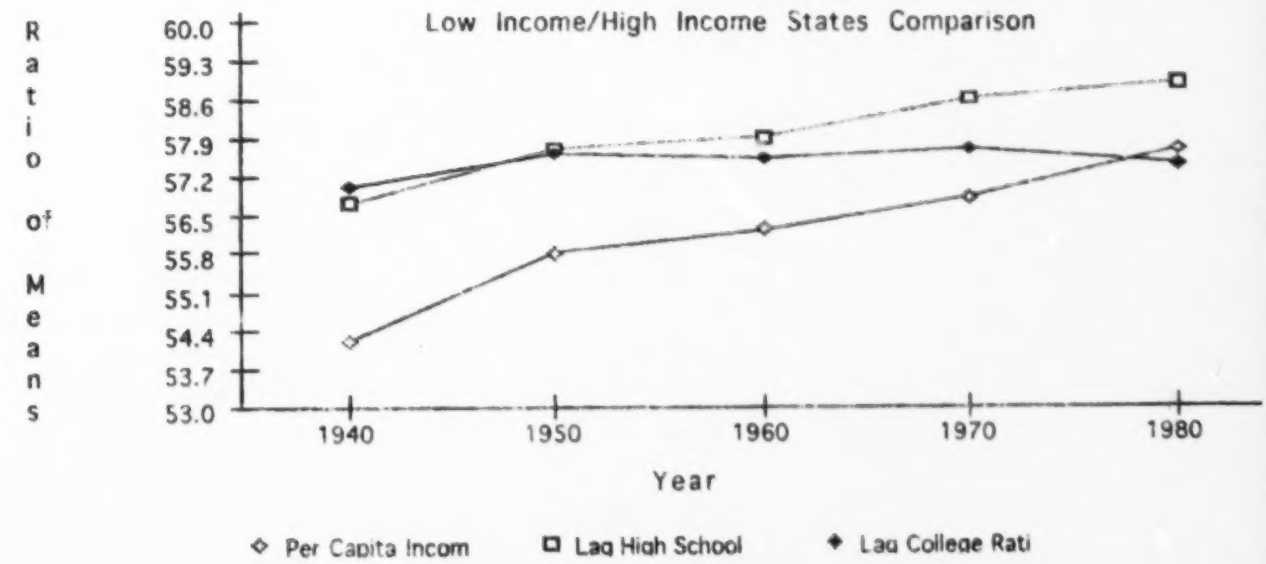

Figure 8. Trends in the Ratio of Mean Income and Lagged Education for Low/High Income States

The only plot produced using these ratios was with the education variables lagged. This was done based upon the results obtained from the previously presented data in which only the lagged educational variables produced a consistent pattern. This plot is provided in Figure 8. The trend between per capita income and the lagged percentage of high school graduates is near perfect with the two trend lines being almost parallel. The trend line for the percentage of the population who are college graduates in the state does not fit as nicely. It must be noted, however, that this variable, the ratio of the percentages of the populations with a bachelors degree, is much more stable than the other two. This ratio only ranges from .70 to .77 across the five data points, whereas, the high school graduation ratio ranges from .67 to .89.

There exists a very strong association between the per capita income in a state and the percentage of that state's population which has graduated from high school ten years later. Changes in the income variable closely parallel changes in the subsequent education level. Developing a causal interpretation of this trend would lead one to hypothesize that the economic conditions which produce higher levels of income seem to foster a larger percentage of the population obtaining a high school degree. The reason for the "supposed" reduced influence of the percentage of the population with a college degree may be due to the much smaller percentage of college graduates in the population and therefore their net influence on per capita income would be much less than that of the pool of high graduates. The relevant point to note with respect to this figure is not the lesser relationship involving the college graduate variable, but the direction of the relationship. Advances in the relative amount of education seem to follow relative advances in income.

The results from the various analyses indicated that a relationship did exist between education level and income, but it seemed to be one in which relative advances in income levels were followed by relative advances in educational level, rather than vice versa. This suggests that when considering economic ends as a possible goal for rural education, one must recognize that the economic development of rural areas, when compared with that of nonrural areas, appears to be more a result of existing economic advantages/disadvantages as opposed to the educational level of the available work force. Within a rural region and for the individual worker, the human capital argument may have some validity, but it does not provide an adequate explanation for the economic development of an entire rural region or state. Taken to the extreme, the results suggest that education can produce the greatest impact on economic development by having students who will develop industry, as opposed to staffing industry.

REFERENCES

Cook, T. & Campbell, D. (1979). Quasi-experimentation: Design and analysis issues for field settings. Chicago, IL: Rand McNally College Publishing Company.

Corporation for Enterprise Development. (1995). The 1995 development report card for the states: Economic benchmarks for state and corporate decision makers. Washington, DC: author.

DeYoung, A. (1989). Economics and American education: A historical and critical overview of economic theories on schooling in the United States. New York: Longman, Inc.

DeYoung, A. & McKenzie, R. (1992). Education and "modernization" in Appalachia: With a case study of the economics and politics of underdevelopment in an East Tennessee school district. Journal of Rural and Small Schools, 5, 10-18.

Hobbes, D. (1995). Capacity building: Reexamining the role of the rural school. In Lionel J. Beaulieu and David Mulkey (eds.), Investing in people: The human capital needs of rural America. Boulder, CO: Westview Press.

Killian, M. & Parker, T. (1991). Higher education no panacea for weak rural economies. Rural Development Perspectives, 7, 2-7.

Redman, J. & Rowley, T. (1989). State-level comparison of metro and nonmetro economic performance, 1979-1986. Economic Research Service Report AGES 89-60. Washington, DC: US Department of Agriculture.

Reich, R. (1991). The work of nations: Preparing ourselves for 21st -century capitalism. New York: Alfred A. Knopf.

The Rural Economic Development Center. (1992). North Carolina rural profile: Economic and social trends affecting rural North Carolina. Raleigh: author.

Wanner, R. & Lewis, L. (1982). Trends in education and earnings, 1950-70: A structural analysis. Social Forces, 61, 436-455.